

WebSphere Application Server Hypervisor Edition 8.5.5

IBM

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WebSphere Application Server Hypervisor Edition, Version 8.5.5 documentation

View the latest WebSphere® Application Server Hypervisor Edition AIX® and Linux documentation. This information applies to Version 8.5.5 and to all subsequent releases and modifications until otherwise indicated in new editions.

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WebSphere Application Server, Hypervisor Edition, Version 8.5.5

View the latest WebSphere® Application Server Hypervisor Edition documentation. WebSphere Application Server Hypervisor Edition is a self-contained virtual machine image that contains a guest operating system and WebSphere Application Server Network Deployment Version 8.5.5.

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WebSphere Application Server Hypervisor Edition overview

IBM® WebSphere® Application Server Hypervisor Edition is a self-contained virtual machine image that contains a guest operating system and WebSphere Application Server Network Deployment Version 8.5. You can run the virtual image on VMware ESX or ESXi hypervisors.

- [Virtualization concepts](#)
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Virtualization concepts

A *virtual machine* or *virtual image* is a complete system platform that contains an operating system on which you can install any number of customized applications to create a complete virtual image. A virtual image requires less time and labor to set up because the operating system and applications are already installed and partially or completely configured.

Virtual images run on a *hypervisor*, which is the virtualization technology that manages the state of virtual images. A hypervisor product can run on top of a host operating system, or the hypervisor can run as the operating system itself, such as VMware ESX. Some hypervisors also handle load balancing and failover.

By deploying virtual images on VMware and other virtualization technologies, you can consolidate servers and streamline your environments.

WebSphere Application Server Hypervisor Edition Version 8.5 can function either as stand-alone or with IBM Workload Deployer. Workload Deployer is a hardware appliance that provides access to software virtual images and patterns.

Using IBM Workload Deployer, you can instantiate patterns that use the WebSphere Hypervisor Edition images and offer self-service deployments of those patterns.

Using IBM Workload Deployer or IBM PureApplication Systems, you can create cluster topologies using WebSphere Hypervisor Edition images.

The virtual image can be used as a demonstration, a development system, or a simple quality assurance system. A single virtual image can also be a single production system for a small department.

WebSphere Hypervisor Edition provides support for multi-hypervisor environments. You can deploy Hypervisor Edition to:

- VMware ESX, ESXi-- as a stand-alone installation, with IBM Workload Deployer, or as part of the IBM PureApplication Systems.
- PowerVM-- with IBM Workload Deployer.
- zVM-- with IBM Workload Deployer.

Virtual image contents

You must extract the product packages and start up the virtual image. You are prompted to complete a series of panels to configure the operating system and the application server on that single virtual machine. For more information, see the installation topics in the documentation.

The WebSphere virtual image contains the following preinstalled software:

- A guest operating system
- WebSphere Application Server Version 8.5
- IBM HTTP Server for WebSphere Application Server Hypervisor Edition
- Web server plug-ins
- IBM Installation Manager
- WebSphere eXtreme Scale Version 8.5 Client
- IBM WebSphere Application Server Web 2.0 and Mobile Toolkit Version 1.1
- IBM WebSphere SDK Java™ Technology Edition Version 7.0

Available virtual images

You can choose from the following available virtual images. All images contain WebSphere Application Server Network Deployment.

Table 1. Available virtual images

Image name	Requirements
WebSphere Application Server Hypervisor Edition Version 8.5 for Novell SUSE Linux® Enterprise Server 32bit	Requires IBM Workload Deployer 3.1.0.2 or higher and IBM Workload Deployer VMware Requirements. Stand-alone requires VMware ESX and ESXi 4.1 or higher.
WebSphere Application Server Hypervisor Edition Version 8.5 for Novell SUSE Linux Enterprise Server 64bit	IBM Workload Deployer 3.1.0.2 or higher, IBM Workload Deployer VMware requirements and VMware ESX and ESXi 4.1 or higher
WebSphere Application Server Hypervisor Edition Version 8.5 for Red Hat Enterprise Linux Server 32bit	IBM Workload Deployer 3.1.0.2 or higher and IBM Workload Deployer VMware requirements. Stand-alone requires VMware ESX and ESXi 4.1 or higher.

Image name	Requirements
WebSphere Application Server Hypervisor Edition Version 8.5 (32bit or 64bit) for Red Hat Enterprise Linux Server 64bit	IBM Workload Deployer 3.1.0.2 or higher, IBM Workload Deployer VMware requirements and VMware ESX and ESXi 4.1 or higher.
WebSphere Application Server Hypervisor Edition Version 8.5 for IBM AIX®	Requires IBM Workload Deployer 3.1.0.2 or higher and IBM Workload Deployer PowerVM® requirements.
WebSphere Application Server Hypervisor Edition Version 8.5 for Novell SLES on System z®	Requires IBM Workload Deployer 3.1.0.2 or higher and IBM Workload Deployer zVM requirements.
WebSphere Application Server Hypervisor Edition Version 8.5 on Red Hat Enterprise Linux for IBM System z	Requires IBM Workload Deployer 3.1.0.2 or higher and IBM Workload Deployer zVM requirements.

IBM HTTP Server and Web Server Plug-ins configuration

The image also contains IBM HTTP Server and the Web Server Plug-ins, which are installed and configured using the user virtuser. Because most of the environment is pre-configured, additional configuration actions are not required for basic operation. The IBM HTTP Server administrative server password matches the virtuser passwords for the operating system and WebSphere administration. You can stop and start IBM HTTP Server using the administrative console. The products are installed at the following locations:

- /opt/IBM/HTTPServer
- /opt/IBM/Plugins

WebSphere profile types

The following table contains WebSphere profile types and descriptions.

Profile Type	Description	Applicable to Version 6.1	Applicable to Version 7.0, 8.0, and 8.5
Application server	Create a stand-alone application server profile.	Yes	Yes
Custom profile	Create a custom profile that belongs to a deployment manager cell. This profile can make applications available to the Internet or to an intranet under the management of the deployment manager. You must federate this node.	Yes	Yes
Deployment manager	Create a deployment manager that provides management capability for multiple federated nodes. The nodes and the deployment manager make up a <i>cell</i> .	Yes	Yes
Job manager	Create a job manager that provides a single console to administer multiple base servers, multiple deployment managers, and do asynchronous job submission.	No	Yes
Administrative agent + n application server profiles	Create an administrative agent that provides a single interface to administer multiple unfederated application servers.	No	Yes

Profile Type	Description	Applicable to Version 6.1	Applicable to Version 7.0, 8.0, and 8.5
Liberty profile server	Create a Liberty profile server that is located on the panel between the deployment manager and the job manager.	No	8.5 only
IBM HTTP Server	Create an IBM HTTP Server profile. When the IBM HTTP Server profile is selected on the blue screens, SLES init.d services is created and started by default for the IBM HTTP Server and adminserver.	Yes	Yes

Maintenance and service

You can apply maintenance and service using either of the following methods:

- Using the IBM Workload Deployer or IBM Pure Application Systems console. For more information, see [Installing virtual images for VMware ESX with IBM Workload Deployer](#).
- Using the IBM Installation Manager. The Installation Manager applies maintenance to the application server inside the virtual image in the same way that it applies maintenance in a native application server environment. Apply maintenance to the application server using the IBM Installation Manager or through updated virtual images from IBM. Apply operating system maintenance to the virtual image through downloadable packages or through updated virtual images from IBM.

Related tasks

- [Installing virtual images for VMware ESX with IBM Workload Deployer](#)

Related information

- [WebSphere Application Server Library](#)
- [IBM Workload Deployer documentation](#)

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WebSphere Application Server Considerations for GDPR readiness

Consider information about WebSphere® Application Server Hypervisor Edition features that you can configure and aspects of product use so that you can prepare your organization for General Data Protection Regulation (GDPR) readiness.

Applicable PID(s): 5724-J08, 5724-H88, 5655-W65, 5724-I63, 5725-A25, 5725-A11, 5725-A12, 5725-X89, 5725-A26

The WebSphere Application Server considerations for GDPR apply to the following PIDs:

- 5724-J08 IBM WebSphere Application Server
- 5724-H88 IBM WebSphere Application Server Network Deployment
- 5655-W65 IBM WebSphere Application Server for z/OS
- 5725-L29 IBM WebSphere Application Server Liberty Core
- 5724-I63 IBM WebSphere Application Server - Express
- 5725-A25 IBM WebSphere Application Server Hypervisor Edition for AIX
- 5725-A11 IBM WebSphere Application Server Hypervisor Edition Novell SLES, System z - Novell Subscription Required
- 5725-A12 IBM WebSphere Application Server Hypervisor Edition Novell SLES, System z - Novell Subscription Not Required
- 5725-X89 IBM WebSphere Application Server Hypervisor Edition for Novell SUSE Linux Enterprise Server
- 5725-A26 IBM WebSphere Application Server Hypervisor Edition for Red Hat Enterprise Linux
- UT:32AEI WebSphere Configuration Migration Tool for IBM Cloud (WCMT4IC)

Notice:

This document is intended to help you in your preparations for GDPR readiness. It provides information about features that you can configure, and aspects of the product's use that you should consider to help your organization with GDPR requirements. This information is not an exhaustive list, due to the many ways that clients can choose and configure features, and the large variety of ways that the product can be used by itself and with third-party applications and systems.

Clients are responsible for ensuring their own compliance with various laws and regulations, including the European Union General Data Protection Regulation. Clients are solely responsible for obtaining advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulations that may affect the clients' business and any actions the clients may need to take to comply with such laws and regulations.

The products, services, and other capabilities described herein are not suitable for all client situations and may have restricted availability. IBM does not provide legal, accounting, or auditing advice or represent or warrant that its services or products will ensure that clients are in compliance with any law or regulation.

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GDPR Overview

The General Data Protection Regulation has been adopted by the European Union ("EU") and applies from May 25, 2018.

Why is GDPR important?

GDPR establishes a stronger data protection regulatory framework for processing of personal data of individuals. GDPR brings:

- New and enhanced rights for individuals
- Widened definition of personal data
- New obligations for companies and organizations handling personal data
- Potential for significant financial penalties for non-compliance
- Compulsory data breach notification

Read more about GDPR:

[Transform your business with the GDPR](#) on ibm.com.

Product Configuration - Considerations for GDPR Readiness

The following sections provide considerations for configuring WebSphere Application Server to help your organization with GDPR readiness.

The GDPR legislation requires that personal data is strictly controlled and that the integrity of the data is maintained. This requires the data to be secured against loss through system failure and also through unauthorized access or by theft of computer equipment or storage media.

Data Life Cycle

GDPR requires that personal data is:

- Processed lawfully, fairly and in a transparent manner in relation to individuals.
- Collected for specified, explicit and legitimate purposes.
- Adequate, relevant and limited to what is necessary.
- Accurate and, where necessary, kept up to date. Every reasonable step must be taken to ensure that inaccurate personal data is erased or rectified without delay.
- Kept in a form that permits identification of the data subject for no longer than necessary.

What are the lawful bases for processing?

The lawful bases for processing are set out in Article 6 of the GDPR. At least one of these lawful bases must apply whenever you process personal data:

1. *Consent*: The individual has given clear consent for you to process their personal data for a specific purpose.
2. *Contract*: The processing is necessary for a contract you have with the individual, or because they have asked you to take specific steps before entering into a contract.
3. *Legal obligation*: The processing is necessary for you to comply with the law (not including contractual obligations).
4. *Vital interests*: The processing is necessary to protect someone's life.
5. *Public task*: The processing is necessary for you to perform a task in the public interest or for your official functions, and the task or function has a clear basis in law.
6. *Legitimate interests*: The processing is necessary for your legitimate interests or the legitimate interests of a third party unless there is a good reason to protect the individual's personal data which overrides those legitimate interests. (This cannot apply if you are a public authority processing data to perform your official tasks.)

Explicit requirements:

1. Ensure the appropriate consent is in place - contract, service, explicit Data Subject consent
2. Understand where the data resides in the application/solution
3. Ensure the data is secured through:
 - Encryption
 - Access control
 - Additional controls
4. Ensure the retention period of this data is clearly defined
5. Ensure the data is deleted at the end of the retention period
6. Ensure all the Data Subject rights can be fulfilled:
 - Higher standards for privacy policies and statements and for obtaining consent
 - Easier access to personal data by a data subject
 - Enhanced right to request the erasure of their personal data
 - Right to transfer personal data to another organization (portability)
 - Right to object to processing now explicitly includes profiling

Product considerations:

There are two types of users who access a WebSphere environment: administrators who manage the WebSphere environment, and users of applications deployed in a WebSphere environment. Administrators generally are configured to log in with their business, not personal accounts. Data collected from administrators may include user ID, password, and audit trail of administration actions that may include IP address, and administrative interfaces, parameters, and results. Data may be persisted in logs files, and audit logs, and are generally required for security audit and forensic analysis.

Users who access applications that are hosted on WebSphere Application Server may be configured to log in with their own personal accounts. Personal data collected by applications is defined by the application, and it is the responsibility of the application to comply with GDPR. However, during the normal course of running the application, personal data may be captured by the WebSphere Application Server infrastructure, and additional configurations may be needed to ensure readiness for GDPR. For example,

- WebSphere logs and traces may capture personal data as a side effect of writing logs for diagnostic purposes.
- Java dumps may contain personal data that is stored in memory.
- Security audit logs may contain user IDs and IP addresses of users.
- SIBus temporary storage in files or database may contain user data that is stored in messages.
- Web Services use temporary storage files for large attachments.

Data Collection

WebSphere collects audit logs, operational logs and trace for service purposes which are persisted to disk as described in the [Data Life Cycle](#) section. Some communication facilities can also persist messages to disk, such as SIBUS message queues. Java heap dumps can also collect operational state and information about customer applications and WebSphere itself.

Considerations for managing this data are given in the following sections.

Data Storage

User identity data is normally not kept in WebSphere, but in some separate repository such as a database or LDAP server. However it is possible to configure a file-based user registry.

To protect access to this information, consider the following:

- Prefer an external user registry that enforces password and auditing policies over the WebSphere file-based registry.
- If a WebSphere file-based registry is used on WebSphere Application Server Liberty, use password encryption.
- Use password encryption to protect passwords to external resources, such as databases.
- Do not use a personal account when configuring access to external resources, such as databases.
- If using the WebSphere Application Server Liberty **bluemixUtility** tool, the tool can cause Bluemix (IBM Cloud®) account credentials to be stored in the Liberty server configuration.
- Do not create WebSphere administrative or operational accounts where personal information is stored. Use business accounts that do not contain personal information.

In general, it is recommended that data that may be captured as a side effect of using the WebSphere Application Server infrastructure be configured with a retention period just long enough for the business purpose of capturing such data, such as problem diagnosis, or security audit, such that data is automatically purged beyond the retention period. If necessary, additional efforts may also be undertaken by the application to reduce the amount of personal information that is captured by WebSphere Application Server. These may include:

- Encryption of logs: file system level, per-file level, or upon archival. (This capability would be provided by the underlying compute resources, not by WebSphere.)
- Sanitizing captured logs and audit records before they are archived, or sent to WebSphere support.
- Protecting Java artifacts such as heap dumps. There is no automatic way to rotate or purge old Java dumps. Consider implementing a retention policy for Java dumps.

In WebSphere Application Server full profile:

- Log file rotation configuration: [Java virtual machine \(JVM\) log settings](#)
- SIBus database message store configuration: [Data store \[Settings\]](#)
- SIBus file message store configuration: [File store \[Settings\]](#)
- JVM custom properties that affect web service temporary storage files: [Java virtual machine custom properties](#)
 - `com.ibm.websphere.webservices.attachment.tempfile.expiration`
 - `org.apache.axiom.attachments.tempfile.expiration`

In WebSphere Application Server Liberty:

- Automatic rotation of log records requires the use of the binary logging feature: [Configuring binary logging in Liberty](#)

Data Access

WebSphere operational data might contain some personal information such as user names or network addresses. WebSphere operational data can be accessed through a defined set of product interfaces, some of which are designed for access through a remote connection, and others for access through a local connection. Access can also be obtained by direct access to the compute resources on which WebSphere is running.

The interfaces should be secured, such that a user must first be authenticated and then checked for authorized roles before obtaining access to data.

Network communication for remote connections can be encrypted by using HTTPS.

Operational logs and trace might be read by product support personnel.

Consider the roles of operational and support staff. Limit their access to data so they do not have wider access than their roles require.

If transmitting log and trace files to IBM or other product supporters, consider sanitizing them for sensitive data prior to transmission.

Customer applications might write data into WebSphere logs. If this is the case, protect the logs as appropriate for the type of data being written.

At the operating system level, consider restricting access to the system and permissions to WebSphere files. Consider using operating system level logging and auditing capabilities to track security events that occur on the operating system, since WebSphere logs and data can be accessed directly from the operating system.

The following topics provide additional details on setting up security event auditing, and setting up WebSphere administrative users with restricted visibility to logs.

Configuring WebSphere for security event auditing:

- In WebSphere Application Server full profile, security event auditing configuration: [Auditing the security infrastructure](#)
- In WebSphere Application Server Liberty, as of April 2018, auditing is under development.

Configuring WebSphere administrative roles:

- In WebSphere Application Server full profile, security roles for various actions are documented in a table in [Fine-grained administrative security](#). Even the lowest level role (monitor) can view the system logs. The trace log cannot be accessed remotely through the administrative console.
- In WebSphere Application Server Liberty, users that are mapped to the administrator role can manage Liberty remotely using the `adminCenter-1.0` feature. As of April 2018, this does not include remote viewing of the logs. See [Setting up Admin Center](#).

Data Processing

- It is the responsibility of applications running on WebSphere to provide the ability for clients to control how their personal data is processed.
- In addition to application capabilities, consider use of encryption and access controls to protect personal data in motion and at rest.
- Encryption in motion
 - Encrypted communication protocols (HTTPS) can be used to encrypt communication between WebSphere and support staff or end users.
 - Access to private encryption keys should be tightly controlled.
- Encryption at rest
 - Log and trace files can be kept on an encrypted volume or directory. (This capability would be provided by the underlying compute resources, not by WebSphere.)
 - Access to private encryption keys should be tightly controlled.

Securing communications using SSL:

- WebSphere Application Server full profile: [Secure communications using Secure Sockets Layer \(SSL\)](#)
- WebSphere Application Server Liberty: [Enabling SSL communication in Liberty](#)

Protecting messages transmitted between buses:

- [Protecting messages transmitted between buses](#)

Data Deletion

WebSphere Application Server runs customer applications. The data these applications collect and how it is deleted are determined by the applications themselves.

Some personal data might be recorded in the operational logs that are produced by WebSphere, as well as any heap dumps. Limit retention of such data to just long enough for the business purpose of capturing such data, such as problem diagnosis, or security audit, such that data is automatically purged beyond the retention period. If it becomes necessary to delete logs and dumps before the retention period, additional administrative actions may be required.

Data Monitoring

WebSphere Application Server runs customer applications. The data these applications collect and how application users can monitor its use are the responsibility of the applications. The WebSphere Application Server audit infrastructure may be used in conjunction with application monitoring to provide coverage for audit data at the infrastructure level, such as login or logout events.

Responding to Data Subject Rights

WebSphere Application Server runs customer applications. The data these applications collect and how to respond to data subject rights are the responsibility of the applications.

The following rights should be considered when developing applications that run on WebSphere. It is recommended that the user IDs used to administer WebSphere be business IDs not containing any personal information.

- Right to Access
 - Can the client provide individuals access to their data?
 - Can the client provide individuals information about what data the client has about the individual?
- Right to Modify
 - Can the client allow an individual to modify or correct their data?
 - Can the client correct an individual's data for them?
- Right to Restrict Processing
 - Can the client stop processing an individual's data?

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Installing virtual images for VMware ESX with IBM Workload Deployer

Start the IBM® WebSphere® Application Server Hypervisor Edition virtual image. Use the IBM Workload Deployer to configure, provision, and activate the product.

Before you begin

To familiarize yourself with IBM WebSphere Application Server Hypervisor Edition, see the IBM WebSphere Application Server Hypervisor Edition overview.

You must have VMWare ESX or ESXi 4.1 or higher to run the WebSphere Application Hypervisor Edition Version image.

Start the IBM WebSphere Application Server Hypervisor Edition virtual image. The owner of all preinstalled IBM WebSphere software is the non-root operating system user named virtuser. To access the operating system environment, you must use the command-line interface through SSH. The x server package is not installed into the operating system. The image is packaged within a single open virtualization appliance (OVA). Only the IBM Workload Deployer can provision the image. For details on provisioning the image, refer to the IBM Workload Deployer documentation.

About this task

The IBM WebSphere Application Server Hypervisor Edition virtual image contains the following products:

Table 1. Included products and descriptions

Product	Description
Novell SLES or RedHat Enterprise Linux Operating System	<ul style="list-style-type: none"> Mounted at / 12 GB SCSI Disk Root user and virtuser operating system IDs No additional drives (For example CD-ROM or DVD) are configured, but they can be added through the VMware ESX Server console.
IBM Binary Disk	<ul style="list-style-type: none"> Mounted at /opt/IBM 13GB SCSI disk
WebSphere Application Server Version 8.5.x	Installed in /opt/IBM/WebSphere/AppServer
IBM HTTP Server for WebSphere Application Server Version 8.5.x	Installed in /opt/IBM/HTTPServer
IBM HTTP Server plug-in for WebSphere Application Server Version 8.5.x	Installed in /opt/IBM/Plugins
IBM Installation Manager	Installed in /opt/IBM/InstallationManager
IBM WebSphere Application Server Liberty Profile	Installed in /opt/IBM/WebSphere/Liberty
Pre-created profiles for WebSphere Application Server Version 8.5.x	Installed in /opt/IBM/WebSphere/Profiles
WebSphere eXtreme Scale Version 8.5.x Client	Installed in /opt/IBM/WebSphere/AppServer
IBM WebSphere Application Server Web 2.0 and Mobile Toolkit	Installed in /opt/IBM/WebSphere/Web20Mobile

The virtual image is set for 1.5 GB of available RAM, which you can increase. The virtual image has NAT networking enabled, which you can change to bridged or host only.

Use the following procedure to install the virtual image product, configure the operating system, and configure the application server product.

Procedure

WebSphere Application Server Hypervisor Edition image must be provisioned through the IBM Workload Deployer.

For more information, see the documentation for the IBM Workload Deployer.

Table 2. WebSphere environment types

Profile Type	Description
Application server	Create a stand-alone application server profile.
Custom profile	Create a custom profile which belongs to a deployment manager cell, to make applications available to the Internet or to an intranet under the management of the deployment manager. You must federate this node to use it.
Deployment manager	Create a deployment manager that provides management capability for multiple federated nodes. The nodes and the deployment manager make up a <i>cell</i> .
Job manager	Create a job manager that provides a single console to administer multiple base servers, multiple deployment managers, and do asynchronous job submission.
Administrative agent + <i>n</i> application server profiles	Create an administrative agent that provides a single interface to administer multiple unfederated application servers.
IBM HTTP Server	Create an IBM HTTP Server profile.
Liberty Profile Server	Create a stand-alone Liberty Server Profile.
On-Demand Router	Create an On-Demand Router.

Results

You have installed and configured the WebSphere virtual image.

What to do next

Log in with the `virtuser` user ID and password you configured earlier.

To apply maintenance and service, use the following steps:

1. From a web browser, log in to the IBM Workload Deployer or PureApplication System console.
2. Upload the virtual images of an older release and the current release from Catalog > Virtual Images.
3. Download the testing related auto script packages to your local system.
4. Create a script package. Select Catalog > Script Packages and upload the packaged files.
5. Create the desired virtual system pattern. Select Patterns > Virtual Systems.
6. Edit the pattern and add the script packages to the proper parts. Enter the WebSphere Application Server repository URL.
7. Save the pattern and deploy the virtual system.
8. After the virtual system is ready and started, expand Virtual machines. Select the attached script packages.
9. After the script packages are complete and the logs are displayed on the IBM Workload Deployer or PureApplication System console, click Services on the deployed Virtual System page. Select the service level you want from Select service level or fixes. Click OK.
10. The update should take several minutes to complete.

- [Profiles for WebSphere Application Server Hypervisor Edition virtual images](#)
IBM WebSphere Application Server Hypervisor Edition includes a set of WebSphere Application Server profiles. These profiles can be augmented with the feature packs that are available for that version of WebSphere Application Server. The Job Manager, IBM HTTP Server, and None profiles cannot be augmented with a feature pack.
- [Managing Liberty profiles with IBM Workload Deployer](#)
You can create and manage a Liberty profile with IBM Workload Deployer.
- [Hints and tips for WebSphere Application Server Hypervisor Edition](#)
When installing, configuring, updating, or using WebSphere Application Server Hypervisor Edition, consider these hints and tips.

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)

Related information

- [IBM Workload Deployer documentation](#)

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Profiles for WebSphere Application Server Hypervisor Edition virtual images

IBM® WebSphere® Application Server Hypervisor Edition includes a set of WebSphere Application Server profiles. These profiles can be augmented with the feature packs that are available for that version of WebSphere Application Server. The Job Manager, IBM HTTP Server, and None profiles cannot be augmented with a feature pack.

8.5 Network Deployment + WebSphere eXtreme Scale client virtual images

The following profiles are available for the Version 8.5 Network Deployment + WebSphere eXtreme Scale client virtual images:

- Cell - optionally augmented with eXtreme Scale client
- Custom - optionally augmented with eXtreme Scale client
- Deployment Manager - optionally augmented with eXtreme Scale client
- Application Server - optionally augmented with eXtreme Scale client
- Admin agent - optionally augmented with eXtreme Scale client
- Job Manager
- IBM HTTP Server - only profile where IBM HTTP server and administrative process started by default
- Liberty Profile Server
- On-Demand Router
- None

Related concepts

- [Hints and tips for WebSphere Application Server Hypervisor Edition](#)

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Managing Liberty profiles with IBM Workload Deployer

You can create and manage a Liberty profile with IBM® Workload Deployer.

Before you begin

To familiarize yourself with IBM WebSphere® Application Server Hypervisor Edition, see the WebSphere Application Server Hypervisor Edition Version 8.5 overview information.

For details on provisioning the image, see the IBM Workload Deployer documentation.

About this task

This task applies to WebSphere Application Server Hypervisor Edition Version 8.5.

You can use the IBM Workload Deployer to build and deploy virtual system patterns which contain Liberty profile application servers.

Use the following procedure to construct a new pattern and create a virtual system image.

Procedure

1. Construct a new pattern.
 - a. On the IBM Workload Deployer home page, go to the Patterns tab.
 - b. Click Virtual Systems.
 - c. On the Virtual System Patterns page, click + to construct a pattern.
 - d. Construct a new pattern, enter a pattern name, and add a description.
 - e. Click OK.
2. Edit the new pattern.
 - a. Select the new pattern from the list of patterns.
 - b. Click Edit.
 - c. On the editor screen, select a Liberty profile server and drag it to the new pattern.
 - d. Click Done editing.
3. Use the new pattern to create a virtual system image.
 - a. On the Virtual Systems Patterns page, click Deploy.
 - b. Enter a `name` for the new virtual system.
 - c. To specify the attributes of the application server, such as the server name, number of processors, memory, and passwords, click Configure virtual parts...>Liberty profile server. A new virtual system image is created that is based on the values you enter. For example, if you enter `myserver` as the server name, the resulting virtual system image has the following directories and files created for you:

Table 1. Generated directories and files

File or directory	Location
Java™ runtime code directory	/opt/IBM/WebSphere/AppServer/java
Liberty profile runtime code directory	/opt/IBM/WebSphere/Liberty
Liberty profile user area directory	/opt/IBM/WebSphere/Profiles/Liberty
Liberty profile server environment file	/opt/IBM/WebSphere/Liberty/etc/server.env
Liberty profile server configuration file	/opt/IBM/WebSphere/Profiles/Liberty/servers/myserver1/server.xml
Liberty profile server output console file	/opt/IBM/WebSphere/Profiles/Liberty/servers/myserver1/logs/console.log
Liberty profile server output messages file	/opt/IBM/WebSphere/Profiles/Liberty/servers/myserver1/logs/messages.log

Results

The new Liberty profile application server, named `myserver1`, has a limited set of features enabled, is started automatically, and has no applications installed. You can manage this application server instance with either script commands or with a Version 8.5 Job Manager. By default, the server instance runs on the IBM Java 1.6 JDK, which is provided during deployment.

The `server.env` file that is created during deployment specifies the JDK that the Liberty profile application server uses and establishes the base directory for user configuration data:

- `JAVA_HOME=/opt/IBM/WebSphere/AppServer/java/jre`
- `WLP_USER_DIR=/opt/IBM/WebSphere/Profiles/Liberty`

What to do next

- You can create, start, or stop Liberty profile servers with the `server` script command in the runtime `bin` directory.
For example, to stop the new server, use SSH to open a command window on the Liberty profile virtual system image. Issue the following command from the `/opt/WebSphere/Liberty/bin` directory: **`./server stop myserver1`**

You can find the output that is generated when the server stops in the output logs directory:

```
/opt/IBM/WebSphere/Profiles/Liberty/usr/servers/myserver1/logs
```

- You can install an application into this server by adding an `<application>` stanza to the following `server.xml` configuration file:

```
/opt/IBM/WebSphere/Profiles/Liberty/usr/servers/myserver1/server.xml
```

For example, to install the Servlet Sample application found on the IBM Developer Works website, stop the server and add the following stanza to the existing `server.xml` file:

```
<application
id="_home_markdown_jenkins_workspace_Transform_htmlout_0_SSCKBL_8.5.5_com.ibm
.websphere.virtualimages.doc_ae_tins_virt_liberty_iwd_sample1"
location="Sample1.war" name="SampleContext" type="war" />
```

Add the application file, Sample1.war, to the /opt/IBM/WebSphere/Profiles/Liberty/servers/myserver1/apps directory and start the server again.

- To run the application, point a web browser to the following url: `http://<your virtual system>:9080/SampleContext/SimpleServlet`

The servlet generates the following message:

```
Simple Servlet ran successfully
```

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)

Related information

- [IBM Workload Deployer Information Center](#)

Last updated: 2021-04-19

Hints and tips for WebSphere Application Server Hypervisor Edition

When installing, configuring, updating, or using WebSphere® Application Server Hypervisor Edition, consider these hints and tips.

The following list contains hints and tips for using WebSphere Application Server Hypervisor Edition as a stand-alone application or with IBM Workload Deployer:

- Stand-alone: When performing the VMware tools update, the /etc/fstab file is altered by the update process. The entries for the application server, IBM® HTTP server and plug-ins disks are deleted. Create a copy of the /etc/fstab directory and use that directory to replace the altered directory after the VMware tools update, for example:

```
cp /etc/fstab /etc/fstab.BeforeVMwaretoolsInstall
update vmware tools
cp /etc/fstab.BeforeVMwaretoolsInstall /etc/fstab
```

- Stand-alone: You might want to compress the finished virtual image before delivery. If you plan to compress the image files, be sure to exit VMware completely before running your compression tool. Failure to close VMware might result in the inclusion of unwanted .lck files in the compressed file. Also, you might want to delete any vmware.log files before compressing your image.
- Stand-alone: The .zip file utility included in most Linux® distributions fails to process an archive that is larger than 4 GB. If the post-compression size of your virtual image results in a .zip file larger than 4 GB, you must use a different compression tool or compress your image in multiple pieces.
- Stand-alone: In order to support double byte character sets, the default virtual image uses the **fbiterm** command during the initial installation. Using the **fbiterm** command only occurs during installation. Once the virtual image is installed and configured, the normal **term** utility is used. The use of the **fbiterm** command interferes with commands you might add to inittab. You cannot include commands in inittab such as `su -c <command> - <command_userid>` before virtual image installation. If your

image requires commands in that format, add those lines to inittab via actions in post configuration scripts.

- Stand-Alone: If you get the following error message during activation: "Error connecting: You need execute access in order to connect with the VMware Console. Access denied for config file. Do you want to try again?" You need to run **chmod 744** on the WebSphere_ESX.vmx file.
- Stand-alone and IBM Workload Deployer: Use caution when modifying system control files, such as inittab.
- Stand-alone and IBM Workload Deployer: The default virtual image is installed with the firewall disabled. Adjust the firewall settings for your virtual image.
- Stand-alone and IBM Workload Deployer: The default virtual image allows the root user to log in directly. You can disable root user's ability to log in and force users to log in using non-root IDs only. To do so, edit `/etc/opt/gnome/gdm/gdm.conf` and change **AllowRoot=true** to **AllowRoot=false**.
- Stand-alone and IBM Workload Deployer: The default virtual image forces a login after the image is initially installed. If you want to automatically log in a user upon installation, edit `/etc/opt/gnome/gdm/gdm.conf` and change the following values:
 - **AutomaticLoginEnable=false** to **AutomaticLoginEnable=true**
 - **AutomaticLogin=** to **AutomaticLogin=<user_name>**

Last updated: 2021-04-19

Installing virtual images for VMware ESX

You can install the virtual image product, configure the operating system, and configure the application server product.

Before you begin

To familiarize yourself with IBM® WebSphere® Application Server Hypervisor Edition, see the IBM WebSphere Application Server Hypervisor Edition overview.

You must have the appropriate version of VMware ESX or VMware ESXi to run the WebSphere Application Server Hypervisor Edition image.

About this task

The IBM WebSphere Application Server Hypervisor Edition virtual image contains the following products:

Table 1. Included products and descriptions

Product	Description
Novell SLES or RedHat Enterprise Linux Operating System	<ul style="list-style-type: none">• Mounted at /• 12 GB SCSI Disk• Root user and virtuser operating system IDs• No additional drives (For example CD-ROM or DVD) are configured, but they can be added through the VMware ESX Server console.
IBM Binary Disk	<ul style="list-style-type: none">• Mounted at /opt/IBM• 13GB SCSI disk

Product	Description
WebSphere Application Server Version 8.5.x	Installed in /opt/IBM/WebSphere/AppServer
IBM HTTP Server for WebSphere Application Server Version 8.5.x	Installed in /opt/IBM/HTTPServer
IBM HTTP Server plug-in for WebSphere Application Server Version 8.5.x	Installed in /opt/IBM/Plugins
IBM Installation Manager	Installed in /opt/IBM/InstallationManager
Pre-created profiles for WebSphere Application Server Version 8.5.x	Installed in /opt/IBM/WebSphere/Profiles
IBM WebSphere Application Server Web 2.0 and Mobile Toolkit	Installed in /opt/IBM/WebSphere/Web20Mobile
WebSphere eXtreme Scale Version 8.5.x client	Installed in /opt/IBM/WebSphere/AppServer

The virtual image is set for 1.5 GB of available RAM, which you can increase. The virtual image has NAT networking enabled, which you can change to bridged or host only.

Use the following procedure to install the virtual image product, configure the operating system, and configure the application server product.

Procedure

1. Upload the .ovf image to your hypervisor.

You need to transfer the IBM WebSphere Application Server Hypervisor Edition virtual system disks to the target hypervisor.

- a. Extract the contents of the compressed packages to your local system.

Run the **tar -xzf** command against each package:

Table 2. Virtual image file names

Product	Files
VMware ESX	<ul style="list-style-type: none"> • was.85xx.nd.linux.vmware.ovf.binary.sles.x86.tgz • was.85xx.nd.linux.vmware.ovf.metadata.sles.x86.tgz • was.85xx.nd.linux.vmware.ovf.sles.x86.os.tgz

- b. Upload the files to the ESX hypervisor.

Transfer the extracted files to the VMware ESX hypervisor using the VMware Infrastructure Client. Click File > Deploy OVF template. In the first panel of the wizard, click browse and locate the WebSphere_V8.ovf file extracted in the previous step. Name your image, select the appropriate datastore, and select the network to use. At the conclusion of the wizard your disks transfer to the hypervisor and the VM is registered.

2. Read the additional notes for the VMware image for more information.
3. Click the POWER ON button to launch the virtual image on the VMware Infrastructure Client or web-based client. The VMware image starts with a command-line login entry display.
4. The virtual machine starts and a command-line interface is displayed. Log in to the operating system using the default root credentials.
 - wasvmx login: root
 - Password: password

Tip: If you make an error while typing in the command-line interface, use the Ctrl+h key combination to backspace.

5. Read and accept all license statements and agreements for both Novell and WebSphere products. If you do not accept all licenses, the virtual image installation halts.

Read each agreement and select I understand and press Enter to continue.

- After the license statements are accepted, the language and keyboard selection panel is displayed. Specify your values, select Accept, and press Enter. Although the operating system supports additional languages, the installation panels are only available in the languages supported by WebSphere Application Server Hypervisor Edition. The following table lists the supported languages:

Table 3. WebSphere Application Server Hypervisor Edition Supported Languages

Locale	Country	Language (UTF-8)
en_US	United States	English
de_DE	Germany	German
ja_JP	Japan	Japanese
ko_KR	Korea	Korean
zh_CN	China	Simplified Chinese
zh_TW	China	Traditional Chinese
fr_FR	France	French
it_IT	Italy	Italian
es_ES	Spain	Spanish
pt_BR	Brazil	Portuguese
cs_CZ	Czech Republic	Czech
hu_HU	Hungary	Hungarian
pl_PL	Poland	Polish
ru_RU	Russia	Russian

- You can create a pattern from the IBM Workload Deployer or PureApplication System console. Select Patterns >Virtual Systems.
- Select the plus icon to create a new pattern. Enter a name for the pattern. Click OK.
- To edit the pattern, select edit. The panel displays the parts from your WebSphere Application Server imported image. You can select and drag parts. To complete the pattern, select Done editing. For more details on Advanced Options, see the IBM Workload Deployer Information Center.
- Select one of the pre-configured WebSphere Application Server profiles, or select None if you prefer to create a profile using the Profile Management Tool or the manageprofiles command after you start up the virtual image.

Select one of the pre-configured WebSphere profile types that are described in the following table:

Table 4. WebSphere environment types

Profile Type	Description		
Application server	Create a stand-alone application server profile.	Custom profile	Create a custom profile which belongs to a deployment manager cell, to make applications available to the Internet or to an intranet under the management of the deployment manager. You must federate this node to use it.

Profile Type	Description
Deployment manager	Create a deployment manager that provides management capability for multiple federated nodes. The nodes and the deployment manager make up a <i>cell</i> .
Job manager	Create a job manager that provides a single console to administer multiple base servers, multiple deployment managers, and do asynchronous job submission.
Administrative agent + n application server profiles	Create an administrative agent that provides a single interface to administer multiple unfederated application servers.
Cell	Create a cell with two profiles: a deployment manager and an application server node that is already federated into the deployment manager cell. This is useful for development environments.
IBM HTTP Server	Create an IBM HTTP Server profile. When the IBM HTTP Server profile is selected on the blue screens, SLES init.d services is created and started by default for the IBM HTTP Server and adminserver.
Liberty profile server	Create a Liberty profile server.
ODR	Create a demand router.

11. To deploy the pattern, select Deploy. Enter a `Virtual System Name` and select the check box.
12. You have the option to choose an environment from the cloud group.
Select `Configure virtual parts >>> Profile type`.
13. Enter and confirm your root password and virtuser password.
Click OK.
14. Deploy the virtual application pattern.
Click OK.

Results

You have installed and configured the WebSphere virtual image. Start your profile environment with the available desktop icons if the environment has not started. If there are problems during activation, you can view the activation logs at `/opt/IBM/AE/AR/ConfigWAS.traceout` and `/opt/IBM/WebSphere/Profiles/.ibm/ConfigWAS.summary`.

Resetting the image:

To reset the image after WebSphere Application Server Hypervisor Edition has been configured, complete the following operation:

- `su - root`
`/var/adm/ibmvmcoc-postinstall/resetvm.sh -notools -resetip`
- Stop the image and delete the directory where you extracted the .tgz files. Do not delete the original .tgz files. Start again by following the installation instructions at the beginning of this document.

What to do next

Start your profile environment with the available desktop icons if the environment has not been started already. Click the Websphere Administrative Console icon to open the administrative console. Log in with the `virtuser` user ID and password you configured earlier.

For information about applying maintenance and service, see [WebSphere Application Server Hypervisor Edition overview](#).

- [Installing IBM WebSphere Application Server Hypervisor Edition silently](#)
The WebSphere Application Server Hypervisor Edition supports the Open Virtualization Format (OVF) 1.0 specification from the Distributed Management Task Force (DMTF). It uses this specification as a silent configuration method for the IBM WebSphere Application Server Hypervisor Edition.
- [Operating system tuning for WebSphere Application Server Hypervisor Edition virtual images](#)
The operating system parameters are tuned automatically in the IBM WebSphere Application Server Hypervisor Edition virtual image to optimize the performance of the included WebSphere Application Server environment.

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)

Related information

- [↗ Centralized installation manager \(CIM\)](#)

Last updated: 2021-04-19

Installing IBM WebSphere Application Server Hypervisor Edition silently

The WebSphere® Application Server Hypervisor Edition supports the Open Virtualization Format (OVF) 1.0 specification from the Distributed Management Task Force (DMTF). It uses this specification as a silent configuration method for the IBM® WebSphere Application Server Hypervisor Edition.

Before you begin

Before proceeding with the following steps, see the OVF 1.0 specifications.

About this task

Silent activation provides an alternative method for configuring your IBM WebSphere Application Server Hypervisor Edition virtual images. Use the following steps to use silent activation to configure a single virtual machine on your ESX hypervisor.

Procedure

1. Upload the OVF image to your hypervisor.
 - a. Extract the contents of the compressed packages to your local system.
Run the **tar -xzf** command against each package:

```
was.8550.nd.linux.vmware.ovf.binary.sles.x86.tgz
was.8550.nd.linux.vmware.ovf.metadata.sles.x86.tgz
was.8550.nd.linux.vmware.ovf.os.sles.x86.tgz
```

After the files are extracted, you have the following files:

- Red Hat:

```
was85-32-RHEL.ovf
RHEL61-32.vmdk
WebSphere.vmdk
```

- Novell SLES:

```
was85-32-SLES.ovf
SLES11-32.vmdk
WebSphere.vmdk
```

- b. Upload the files to the ESX hypervisor.
Transfer the extracted files to the VMware ESX hypervisor using the VMware Infrastructure Client. Click File > Deploy OVF Template... In the first panel, click browse and locate the WebSphere_V85_ESX_RHEL8632.ovf file extracted in the previous step. Follow the wizard to name your image, select the appropriate datastore, and select the network to use. At the conclusion of the wizard, your disks transfer to the hypervisor and the VM is registered.
2. Prepare the silent activation file.
The OVF specification recommends an ISO image to contain a ovf-env.xml file that specifies multiple configuration parameters for the virtual machine. See ovf-env.xml file for details on the ovf-env.xml file.
 3. Create the ISO image.
You can create the ISO image with standard ISO creation software. The following example shows how to create the ISO with the **mkisofs** utility.

```
mkdir /tmp/ovfenv
cp ovf-env.xml /tmp/ovfenv
mkisofs -J -r -o activation.iso /tmp/ovfenv
```

4. Transfer the activation.iso file to the data store where IBM WebSphere Application Server Hypervisor Edition virtual image disks are located.
Transfer the activation.iso file to the data store. Click manage datastores. Click the upload files icon.
5. Confirm that the activation.iso file is attached to the virtual image.
Using the VMware Infrastructure Client, click the virtual machine image to which you want to attach the .iso. Click settings and go to the CD ROM section and verify that the **activation.iso** file is the primary iCD image for the virtual machine.
6. Start the virtual machine by right-clicking the virtual machine name and selecting **Power On**.

Results

After successfully completing these steps, you have silently configured a single virtual machine that is running and available for use.

What to do next

Click the Websphere Administrative Console icon to open the administrative console. Log in with the `virtuser` user ID and password you configured with the `ovf-env.xml` file.

- [ovf-env.xml file](#)
Use the silent activation `ovf-env.xml` file to specify configuration parameters

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)
- [Operating system tuning for WebSphere Application Server Hypervisor Edition virtual images](#)

Related information

- [OVF 1.0 Specification](#)

Last updated: 2021-04-19

ovf-env.xml file

Use the silent activation `ovf-env.xml` file to specify configuration parameters

The OVF specification recommends that an ISO image contain an `ovf-env.xml` file. The complete specification is located at the OVF 1.0 Specification website. This file is used during silent activation to configure your virtual machine. See the following example:

```
<?xml version="1.0" encoding="UTF-8"?>
<Environment xmlns="http://schemas.dmtf.org/ovf/environment/1"
  xmlns:ovf="http://schemas.dmtf.org/ovf/envelope/1"
  xmlns:ovfenv="http://schemas.dmtf.org/ovf/environment/1"
  xmlns:rasd="http://schemas.dmtf.org/wbem/wscim/1/cim-
schema/2/CIM_ResourceAllocationSettingData"
  xmlns:vssd="http://schemas.dmtf.org/wbem/wscim/1/cim-
schema/2/CIM_VirtualSystemSettingData"
  xmlns:xsi="https://www.w3.org/2001/XMLSchema-instance"
  ovf:id="_home_markdown_jenkins_workspace_Transform_htmlout_0_SCKBL_8.5.5_com.ibm.
websphere.virtualimages.doc_ae_rins_virt_apfile_1/DMGR_1">

  <PropertySection>
    <Property ovfenv:key="License.accept" ovfenv:value="yes"/>
    <Property ovfenv:key="ConfigLocale.language" ovfenv:value="en"/>
    <Property ovfenv:key="ConfigLocale.country" ovfenv:value="US"/>
    <Property ovfenv:key="ConfigLocale.encoding" ovfenv:value="UTF-
8"/>
    <Property ovfenv:key="ConfigNET.bootproto" ovfenv:value="static"/>
    <Property ovfenv:key="ConfigNET.hostname" ovfenv:value="myvm"/>
    <Property ovfenv:key="ConfigNET.domain"
  ovfenv:value="sample.my.company "/>
  </PropertySection>
</Environment>
```

```

        <Property ovfenv:key="ConfigNET.ipaddr" ovfenv:value="10.0.0.5"/>
        <Property ovfenv:key="ConfigNET.netmask"
ovfenv:value="255.255.255.0"/>
        <Property ovfenv:key="ConfigNET.gateway" ovfenv:value="10.0.0.1"/>
        <Property ovfenv:key="ConfigNET.pri_dns"
ovfenv:value="10.0.0.100"/>
        <Property ovfenv:key="ConfigNET.sec_dns"
ovfenv:value="10.0.0.101"/>
        <Property ovfenv:key="ConfigPWD_ROOT.username"
ovfenv:value="root"/>
        <Property ovfenv:key="ConfigPWD_ROOT.password"
ovfenv:value="mypassword"/>
        <Property ovfenv:key="ConfigPWD_USER.username"
ovfenv:value="virtuser"/>
        <Property ovfenv:key="ConfigPWD_USER.password"
ovfenv:value="mypassword"/>
        <Property ovfenv:key="ConfigWAS.type" ovfenv:value="dmgr"/>
        <Property ovfenv:key="ConfigWAS.colocateihs"
ovfenv:value="false"/>
        <Property ovfenv:key="ConfigWAS.cell_name"
ovfenv:value="HypervisorEditionCell"/>
        <Property ovfenv:key="ConfigWAS.node_name"
ovfenv:value="HypervisorEditionNode"/>
        <Property ovfenv:key="ConfigWAS.autostart" ovfenv:value="true"/>
        <Property ovfenv:key="ConfigWAS.augment_list"
ovfenv:value="none"/>
        <Property ovfenv:key="ConfigVNC.enabled" ovfenv:value="true"/>
        <Property ovfenv:key="ConfigVNC.username"
ovfenv:value="virtuser"/>
        <Property ovfenv:key="ConfigVNC.password" ovfenv:value="mypass"/>
        <Property ovfenv:key="ConfigNTP.ntp.0"
ovfenv:value="ntp1.mycompany.org"/>
        <Property ovfenv:key="ConfigNTP.ntp.1"
ovfenv:value="ntp2.mycompany.org"/>
        <Property ovfenv:key="ConfigNTP.ntp.2"
ovfenv:value="ntp2.mycompany.org"/>
        <Property ovfenv:key="ConfigNTP.ntp.3"
ovfenv:value="ntp3.mycompany.org"/>
</PropertySection>
</Environment>

```

The following table contains the properties, their valid values, and a description:

Table 1. Properties, valid values, and description

Property	Valid values	Description
<Property ovfenv:key="License.accept" ovfenv:value="yes"/>	yes no	Accepts the IBM® WebSphere® Application Server Hypervisor Edition license, the Novell SuSE license and the VMware tools license. The VM will not start unless this is set to <i>yes</i> .
<Property ovfenv:key="ConfigLocale.language" ovfenv:value="en"/>	en de ja ko zh fr it es pt cs hu pl ru	The locale the virtual machine starts in.
<Property ovfenv:key="ConfigLocale.country" ovfenv:value="US"/>	US DE JP KR CN TW FR IT ES BR CZ HU PL RU	The country locale the virtual machine starts in.

Property	Valid values	Description
<Property ovfenv:key="ConfigLocal e.encoding" ovfenv:value="UTF-8"/>	UTF-8	The machine encoding for the VM
<Property ovfenv:key="ConfigNET.b ootproto" ovfenv:value="static"/>	static dhcp	The networking boot protocol for the VM
<Property ovfenv:key="ConfigNET.h ostname" ovfenv:value="myvm"/>	any valid hostname	The hostname for the virtual machine
<Property ovfenv:key="ConfigNET.d omain" ovfenv:value="sample.m y.company "/>	any valid domain	The networking domain; it matches the hostname
<Property ovfenv:key="ConfigNET.i paddr" ovfenv:value="10.0.0.5"/ >	any valid IP address	Not needed if using DHCP
<Property ovfenv:key="ConfigNET.n etmask" ovfenv:value="255.255.2 55.0"/>	any valid IP address netmask	Not needed if using DHCP
<Property ovfenv:key="ConfigNET.g ateway" ovfenv:value="10.0.0.1"/ >	any valid IP address gateway	Not needed if using DHCP
<Property ovfenv:key="ConfigNET.p ri_dns" ovfenv:value="10.0.0.10 0"/>	any valid DNS server (primary)	Not needed if using DHCP
<Property ovfenv:key="ConfigNET.s ec_dns" ovfenv:value="10.0.0.10 1"/>	a valid DNS server (secondary)	Not needed if using DHCP
<Property ovfenv:key="ConfigPWD_ ROOT.username" ovfenv:value="root"/>	root	The root user name. Do not change.

Property	Valid values	Description
<Property ovfenv:key="ConfigPWD_ROOT.password" ovfenv:value="mypasswo rd"/>	any valid password	The root operating system password
<Property ovfenv:key="ConfigPWD_USER.username" ovfenv:value="virtuser"/ >	virtuser	The non-root user defined for the operating system and WebSphere. Do not change.
<Property ovfenv:key="ConfigPWD_USER.password" ovfenv:value="mypasswo rd"/>	any valid password	Password for virtuser, used by WebSphere and the operating system.
<Property ovfenv:key="ConfigWAS.t ype" ovfenv:value="dmgr"/>	dmgr default custom adminagent jmgr liberty odr	The profile type to configure on this VM. The liberty, odr, adminagent and jmgr options are not valid for version 6.1.0.x virtual images. The liberty and odr options are not valid for versions prior to 8.5 virtual images.
<Property ovfenv:key="ConfigWAS.l iberty_server_name" ovfenv:value="server"/>	any valid liberty server name	
<Property ovfenv:key="ConfigWAS. colocateihs" ovfenv:value="false"/>	true false	Whether you want IBM HTTP Server configured on this VM. Only valid on dmgr nodes.
<Property ovfenv:key="ConfigWAS. cell_name" ovfenv:value="Hypervis orEditionCell"/>	any valid cell name	The cell name you configured for this VM. For custom profiles that are federated this value is thrown away.
<Property ovfenv:key="ConfigWAS. node_name" ovfenv:value="Hypervis orEditionNode"/>	any valid node name	The node name you configured for this VM.
<Property ovfenv:key="ConfigWAS. autostart" ovfenv:value="true"/>	true false	Specifies if the server is started automatically.
<Property ovfenv:key="ConfigWAS. augment_list" ovfenv:value="none"/>	none, sca	The feature packs to augment into the profile. Only valid on version 7.x virtual images.
<Property ovfenv:key="ConfigVNC.e nabled" ovfenv:value="true"/>	true false	Configure the virtual machine for VNC administration

Property	Valid values	Description
<Property ovfenv:key="ConfigVNC.u sername" ovfenv:value="virtuser"/ >	virtuser	Do not change
<Property ovfenv:key="ConfigVNC.p assword" ovfenv:value="mypass"/ >	any valid password	The password for VNC access
<Property ovfenv:key="ConfigNTP.n tp.0" ovfenv:value="ntp1.myco mpany.org"/>	any valid NTP server	A valid NTP server is needed to ensure correct time keeping on the virtual machine.
<Property ovfenv:key="ConfigWAS. dmgr_federate" ovfenv:value="true"/>	true false	If dmgr_federate is set to true the following values are required. The values are used to federate the custom or default node into the targeted deployment manager. <pre><Property ovfenv:key="ConfigWAS.dmgr_host" ovfenv:value="hostname.ibm.com"/> <Property ovfenv:key="ConfigWAS.dmgr_conntype" ovfenv:value="SOAP"/> <Property ovfenv:key="ConfigWAS.dmgr_jmlexport" ovfenv:value="8879"/> <Property ovfenv:key="ConfigWAS.dmgr_user" ovfenv:value="virtuser"/> <Property ovfenv:key="ConfigWAS.dmgr_pass" ovfenv:value="password"/></pre>
<Property ovfenv:key="ConfigWAS.j mgr_federate" ovfenv:value="true"/>	true false	If jmgr_federate is set to true the following values are required. The values are used to federate the custom or default node into the targeted job manager. <pre><Property ovfenv:key="ConfigWAS.jmgr_host" ovfenv:value="hostname.ibm.com"/> <Property ovfenv:key="ConfigWAS.jmgr_conntype" ovfenv:value="SOAP"/> <Property ovfenv:key="ConfigWAS.jmgr_user" ovfenv:value="virtuser"/> <Property ovfenv:key="ConfigWAS.jmgr_pass" ovfenv:value="password"/></pre>

Related information

- [OVF 1.0 Specification](#)

Last updated: 2021-04-19

Operating system tuning for WebSphere Application Server Hypervisor Edition virtual images

The operating system parameters are tuned automatically in the IBM® WebSphere® Application Server Hypervisor Edition virtual image to optimize the performance of the included WebSphere Application Server environment.

The Novell SLES 11 operating system included on your virtual images have been tuned for increased performance. The following settings and variables have been automatically set in the image:

- `timeout_timewait` parameter
 - This parameter determines the time that must elapse before TCP/IP can release a closed connection and reuse those resources. This interval between the closure of the connection and the release of the resources is known as the `TIME_WAIT` state or twice the maximum segment lifetime (2MSL) state. During this time, reopening the connection to the client and the server costs less than establishing a new connection. By reducing the value of this parameter, TCP/IP can release the closed connections faster, providing additional resources for new connections. Adjust this parameter if the running application requires rapid release, the creation of new connections, and a low throughput due to multiple connections sitting in the `TIME_WAIT` state. Issue the following command to set the `timeout_timewait` parameter to 30 seconds:

```
echo 30 > /proc/sys/net/ipv4/tcp_fin_timeout
```
 - Recommended value: 30 seconds
- Linux® file descriptors (`ulimit`)
 - The Linux file descriptors specify the number of open files that are supported. The default setting is typically sufficient for most applications. If the value set for this parameter is too low, a file open error, a memory allocation failure, or a connection establishment error might be displayed. Check the UNIX reference pages on the **`ulimit`** command for the syntax of different shells. To set the **`ulimit`** command to 8192 for the Korn shell (ksh), issue the **`ulimit -n 8192`** command. Use the **`ulimit -a`** command to display the current values for all limitations on the system resources.
 - Recommended value: 8192 files
- Connection backlog
 - The connection backlog can be changed with the following parameters when a high rate of incoming connection requests result in connection failures. Issue the following command to set the `netdev_max_backlog` parameter and the `somaxconn` parameter to 3000 connections:

```
echo 3000 > /proc/sys/net/core/netdev_max_backlog
echo 3000 > /proc/sys/net/core/somaxconn
```
 - Recommended value: 3000 connections
- `TCP_KEEPALIVE_INTERVAL` parameter
 - The `TCP_KEEPALIVE_INTERVAL` parameter determines the wait time between the `isAlive` interval probes. Issue the following command to set the value to 15 seconds:

```
echo 15 > /proc/sys/net/ipv4/tcp_keepalive_intvl
```
 - Recommended value: 15 seconds
- `TCP_KEEPALIVE_PROBES` parameter
 - The `TCP_KEEPALIVE_PROBES` parameter determines the number of probes that occur before timing out. Issue the following command to set the value to 5 seconds:

```
echo 5 > /proc/sys/net/ipv4/tcp_keepalive_probes
```
 - Recommended value: 5 seconds

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)

Last updated: 2021-04-19

Installing WebSphere Application Server Hypervisor Edition for IBM AIX

You can use the IBM Workload Deployer to configure, provision, and activate the product.

Before you begin

To familiarize yourself with IBM® WebSphere® Application Server Hypervisor Edition, see the IBM WebSphere Application Server Hypervisor Edition overview.

The pSeries image requires 30 GB of free disk space. Refer to the IBM Workload Deployer documentation for important system infrastructure requirements.

The owner of all preinstalled IBM WebSphere software is the non-root operating system user named virtuser. To access the operating system environment, you must use the command-line interface through SSH. The x server package is not installed into the operating system. The image is packaged within a single open virtualization appliance (OVA). Only the IBM Workload Deployer can provision the image. For details on provisioning the image, refer to the IBM Workload Deployer documentation.

About this task

The IBM WebSphere Application Server Hypervisor Edition for IBM AIX® virtual images contain the following products:

Table 1. Version 8.5 products and descriptions

Product	Description
AIX 6.1 and AIX 7.1 64-bit operating system	Contains root user and virtuser operating system IDs
WebSphere Application Server Version 8.5 64-bit with optional XC10 client	/opt/IBM/WebSphere/AppServer
IBM HTTP Server for WebSphere Application Server Version 8.5	/opt/IBM/HTTPServer
IBM HTTP Server Plug-in for WebSphere Application Server Version 8.5	/opt/IBM/Plugins
IBM Installation Manager	/opt/IBM/InstallationManager
Pre-created profiles for WebSphere Application Server Version 8.5	/opt/IBM/WebSphere/Profiles
IBM WebSphere Application Server Web 2.0 and Mobile Toolkit	Installed in /opt/IBM/WebSphere/Web20Mobile

The virtual image is set for 2 GB of available RAM, which can be increased. The virtual image has NAT networking enabled, which can be changed to bridged or host only.

Procedure

WebSphere Application Server Hypervisor Edition for IBM AIX must be provisioned through the IBM Workload Deployer.

For more information, see the documentation for IBM Workload Deployer.

Results

You have successfully provisioned WebSphere Application Server Hypervisor Edition for IBM AIX.

What to do next

Log in with the user ID and password you configured during image activation.

- [Performance tuning for WebSphere Application Server Hypervisor Edition for IBM AIX](#)
To optimize performance, operating system and WebSphere Application Server parameters are automatically tuned in the IBM® WebSphere® Application Server Hypervisor Edition virtual image.
- [Hints and tips for WebSphere Application Server Hypervisor Edition for IBM AIX](#)
When installing, configuring, updating, or using the WebSphere Application Server Hypervisor Edition, consider these points.

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)

Related information

- [IBM Workload Deployer documentation](#)
- [VMware Web site](#)

Last updated: 2021-04-19

Performance tuning for WebSphere Application Server Hypervisor Edition for IBM AIX

To optimize performance, operating system and WebSphere Application Server parameters are automatically tuned in the IBM® WebSphere® Application Server Hypervisor Edition virtual image.

- [Operating System Tuning](#)
- [WebSphere Application Server Tuning](#)

Operating System Tuning

The IBM AIX 6.1 operating system included on your virtual images has been tuned for increased performance. The following tuning parameters are automatically set in the image and can be modified using virtuser only:

- Environment variables
 - The following environment variables are set for virtuser in ~virtuser/.profile:

```
envfile=~virtuser/.profile
echo "\nexport AIXTHREAD_SCOPE=S" >> $envfile
echo "\nexport LDR_CNTRL=DATAPSIZE=64K@TEXTPSIZE=64K@STACKPSIZE=64K" >>
$envfile
```

- User resource limits
 - The following user resource limits are set for virtuser in /etc/security/limits

```
chuser nofiles=-1 data=-1 stack=-1 rss=-1 cpu=-1 virtuser
```

- nofiles soft file descriptor limit recommended value: -1 (unlimited)
 - data soft data segment size in blocks recommended value: -1 (unlimited)
 - stack soft stack segment size in blocks recommended value: -1 (unlimited)
 - rss soft real memory usage in blocks recommended value: -1 (unlimited)
 - cpu soft per process CPU time limit in seconds recommended value: -1 (unlimited)
- Network tuning parameters
 - The following network tuning parameters are set

```
no -p -o tcp_timewait=1
no -p -o tcp_keepidle=600
no -p -o tcp_keepintvl=10
no -p -o tcp_keepinit=40
no -p -o sack=1
no -p -o rfc1323=1
no -p -o sb_max=1114112
no -p -o tcp_mssdflt=1448
```

WebSphere Application Server Tuning

WebSphere Hypervisor Edition automatically tunes application servers and deployment managers based on the virtual resources allocated to the virtual image. The automatic tuning attempts to optimize your virtual system for performance, but can easily be changed to meet the specific needs of your application. The Java heap size is sized based on the allocated virtual memory, WebSphere Application Server web container threads are sized based on the number of virtual CPUs.

- Java Heap Size
 - The formula used to calculate the Java heap size is:

```
Minimum/Maximum JVM Heap = max(min((Virtual Memory - 1280MB) / # Application
Server Instances, 4096MB), 256MB)
```

Based on the amount of virtual memory allocated to a virtual image, the intent is to distribute as much memory as possible to each application server and deployment manager instance. After reserving 1280MB for the operating system and other native processes, the remaining memory is divided evenly between each Java Virtual Machine (JVM). The automatic tuning algorithm will assign no less than 256MB, and no more than 4GB for a given JVM.

- WebSphere Application Server Web Container Threads
 - The formula used to calculate the number of web container threads is:

```
Minimum/Maximum Threads = # Virtual CPUs * 10
```

A factor of 10 modifies the number of web container threads according to the number of virtual processors in the virtual image. The purpose is to provide additional worker threads to effectively utilize systems with more virtual CPU resource.

-X parameters for WebSphere Application Server on pSeries:

- -Xcodecache20m
 - Default value is 8MB.
 - Sets the unit size of the memory blocks that are allocated to store the native code of compiled Java methods. You can choose an appropriate size for the application being run. By default, this parameter is selected internally, according to the CPU architecture and capability of your system.
- -Xlp64k
 - Default value is 4KB.
 - Use this setting with the IBM virtual machine for Java to allocate the heap using a 64KB page size (medium pages). Using this virtual memory page size for the memory that an application requires can improve the performance and throughput of the application, because of hardware efficiencies that are associated with a larger page size. AIX has rich support around 64KB pages, and 64KB pages are intended to be general purpose. You can change this setting without changing the operating system configuration.

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)

Related tasks

- [Installing WebSphere Application Server Hypervisor Edition for IBM AIX](#)

Last updated: 2021-04-19

Hints and tips for WebSphere Application Server Hypervisor Edition for IBM AIX

When installing, configuring, updating, or using the WebSphere® Application Server Hypervisor Edition, consider these points.

- The WebSphere Application Server administrative user ID, virtuser, and password are configured into the soap.client.props file and the ipc.client.props file when the virtual image is configured. The passwords are encrypted with the ProfFilePasswordEncoder script. If you subsequently change the password for the virtuser user ID, you must update these files.

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)

Related tasks

- [Installing WebSphere Application Server Hypervisor Edition for IBM AIX](#)

Last updated: 2021-04-19

Installing WebSphere Application Server Hypervisor Edition on System z

IBM® WebSphere® Application Server Hypervisor Edition is available for Novell SLES and RedHat Enterprise Linux® on System Z. Use the IBM Workload Deployer to configure, provision, and activate the product.

Before you begin

To familiarize yourself with IBM WebSphere Application Server Hypervisor Edition, see the IBM WebSphere Application Server Hypervisor Edition overview.

The System z image requires 25 GB of free disk space.

Start the IBM WebSphere Application Server Hypervisor Edition virtual image. The owner of all preinstalled IBM WebSphere software is the non-root operating system user named virtuser. To access the operating system environment, you must use the command-line interface through SSH. The x server package is not installed into the operating system. The image is packaged within a single open virtualization appliance (OVA). Only the IBM Workload Deployer can provision the image. For details on provisioning the image, refer to the IBM Workload Deployer documentation.

About this task

IBM WebSphere Application Server Hypervisor Edition is available for Novell SLES and RedHat Enterprise Linux on System Z. Version 8.5 includes IBM WebSphere SDK Java Technology Edition Version 7.0.1.0. The following table displays the products that are included with Version 8.5:

Table 1. Version 8.5 products and descriptions

Product	Description
Novell Suse Linux Enterprise Server or RedHat Enterprise Linux on System Z	Contains root user and virtuser operating system IDs
WebSphere Application Server Version 8.5 64-bit with optional XC10 client	/opt/IBM/WebSphere/AppServer
IBM HTTP Server for WebSphere Application Server Version 8.5	/opt/IBM/HTTPServer
IBM HTTP Server Plug-in for WebSphere Application Server Version 8.5	/opt/IBM/Plugins
IBM Installation Manager	/opt/IBM/InstallationManager
Pre-created profiles for WebSphere Application Server Version 8.5	/opt/IBM/WebSphere/Profiles
IBM WebSphere Application Server Web 2.0 and Mobile Toolkit	Installed in /opt/IBM/WebSphere/Web20Mobile

Table 2. Profile types and descriptions

Profile type	Description	Applicable to Version 8.5
Application server	Create a stand-alone application server profile.	Yes

Profile type	Description	Applicable to Version 8.5
Custom profile	Create a custom profile that belongs to a deployment manager cell. This profile can make applications available to the Internet or to an intranet under the management of the deployment manager. You must federate this node.	Yes
Deployment manager	Create a deployment manager that provides management capability for multiple federated nodes. The nodes and the deployment manager make up a <i>cell</i> .	Yes
Job manager	Create a job manager that provides a single console to administer multiple base servers, multiple deployment managers, and do asynchronous job submission.	Yes
Administrative agent + n application server profiles	Create an administrative agent that provides a single interface to administer multiple unfederated application servers.	Yes
Liberty profiles	Create a Liberty profile server that is located on the panel between the deployment manager and the job manager.	8.5 only
IBM HTTP Server	Create an IBM HTTP Server profile. When the IBM HTTP Server profile is selected on the blue screens, SLES init.d services is created and started by default for the IBM HTTP Server and adminserver.	Yes

The virtual image is set for 2 GB of available RAM, which can be increased. The virtual image has NAT networking enabled, which can be changed to bridged or host only.

Procedure

WebSphere Application Server Hypervisor Edition images on System z® must be provisioned through the IBM Workload Deployer.

For more information, see the documentation for the IBM Workload Deployer.

Results

You have successfully provisioned WebSphere Application Server Hypervisor Edition on System z.

What to do next

Log in with the user ID and password you configured during image activation.

- [Performance tuning for WebSphere Application Server Hypervisor Edition for Novell SLES on System z](#)
To optimize performance, operating system and WebSphere Application Server parameters are automatically tuned in the IBM® WebSphere® Application Server Hypervisor Edition virtual image.
- [Hints and tips for WebSphere Application Server Hypervisor Edition for Novell SLES on System z](#)
When installing, configuring, updating, or using the WebSphere Application Server Hypervisor Edition, consider these points.

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)

Related information

- [IBM Workload Deployer documentation](#)
- [VMware Web site](#)

Last updated: 2021-04-19

Performance tuning for WebSphere Application Server Hypervisor Edition for Novell SLES on System z®

To optimize performance, operating system and WebSphere® Application Server parameters are automatically tuned in the IBM® WebSphere® Application Server Hypervisor Edition virtual image.

- [Operating System Tuning](#)
- [WebSphere Application Server Tuning](#)
- [Read-only mode](#)

Operating System Tuning

The zLinux operating system included on your virtual images has been tuned for increased performance. The following tuning parameters are automatically set in the image and can be modified using virtuser only:

- `timeout_timewait` parameter
 - This parameter determines the time that must elapse before TCP/IP can release a closed connection and reuse those resources. The interval between the closure of the connection and the release of the resources is known as the TIME_WAIT state, or twice the maximum segment lifetime (2MSL) state. During this time, reopening the connection to the client and the server costs less than establishing a new connection. By reducing the value of this parameter, TCP/IP can release the closed connections faster and provide additional resources for new connections. Adjust this parameter if the running application requires rapid release, the creation of new connections, and a low throughput due to multiple connections sitting in the TIME_WAIT state. For example, issue the following command to set the `timeout_timewait` parameter to 30 seconds:

```
echo 30 > /proc/sys/net/ipv4/tcp_fin_timeout
```
 - Recommended value: 30 seconds
- Linux® file descriptors (`ulimit`)
 - The Linux file descriptors specify the number of open files that are supported. The default setting is typically sufficient for most applications. If the value set for this parameter is too low, a file open error, a memory allocation failure, or a connection establishment error might be displayed. Check the UNIX reference pages on the `ulimit` command for the syntax of different shells. To set the `ulimit` command to 8192 for the Korn shell (ksh), issue the `ulimit -n 8192` command. Use the `ulimit -a` command to display the current values for all limitations on the system resources.
 - Recommended value: 8192 files
- Connection backlog
 - When a high rate of incoming connection requests result in connection failures, the connection backlog can be changed with the following parameters. Issue the following command to set the

netdev_max_backlog parameter and the somaxconn parameter to 3000 connections:

```
echo 3000 > /proc/sys/net/core/netdev_max_backlog
echo 3000 > /proc/sys/net/core/somaxconn
```

- Recommended value: 3000 connections
- TCP_KEEPALIVE_INTERVAL parameter
 - The TCP_KEEPALIVE_INTERVAL parameter determines the wait time between the isAlive interval probes. Issue the following command to set the value to 15 seconds:

```
echo 15 > /proc/sys/net/ipv4/tcp_keepalive_intvl
```

- Recommended value: 15 seconds
- TCP_KEEPALIVE_PROBES parameter
 - The TCP_KEEPALIVE_PROBES parameter determines the number of probes that occur before timing out. Issue the following command to set the value to 5 seconds:

```
echo 5 > /proc/sys/net/ipv4/tcp_keepalive_probes
```

- Recommended value: 5 seconds
- sched_compat_yield parameter
 - Configure the Linux kernel to use a heuristic for sched_yield() that is more compatible with earlier versions, by setting the sched_compat_yield tunable kernel property to:

```
1
echo 1 > /proc/sys/kernel/sched_compat_yield
```

WebSphere Application Server Tuning

WebSphere Hypervisor Edition automatically tunes application servers and deployment managers based on the virtual resources allocated to the virtual image. The automatic tuning attempts to optimize your virtual system for performance, but can be changed to meet the specific needs of your application. The Java™ heap size is based on the allocated virtual memory. WebSphere Application Server web container threads are sized based on the number of virtual CPUs.

- Java Heap Size
The formula used to calculate the Java heap size is:

```
Minimum/Maximum JVM Heap = max(min((Virtual Memory - 1280MB) / # Application Server Instances, 4096MB), 256MB)
```

Based on the amount of virtual memory allocated to a virtual image, the intent is to distribute as much memory as possible to each application server and deployment manager instance. After reserving 1280MB for the OS and other native processes, the remaining memory is divided evenly between each Java Virtual Machine (JVM). The automatic tuning algorithm will assign no less than 256MB, and no more than 4GB for a given JVM.

- WebSphere Application Server Web Container Threads
The formula used to calculate the number of web container threads is:

```
Minimum/Maximum Threads = # Virtual CPUs * 10
```

A factor of 10 modifies the number of web container threads according to the number of virtual processors in the virtual image. The purpose is to provide additional worker threads to effectively utilize systems with more virtual CPU resource.

Read-only mode

Read-only mode is a feature of WebSphere Application Server Hypervisor Edition that enables you to use less disk space.

- **Benefits**
 - When read-only mode is set, virtual machines can share the disk containing the operating system and the disk containing the WebSphere Application Server binary. Sharing these disks creates a memory savings of 2 Mod 9 disks per virtual machine.
 - You can edit configurations and profiles.
- **Limitations**
 - You cannot modify or install fix packs.
 - You cannot apply maintenance.

Avoid trouble: Once a WebSphere Application Server Hypervisor Edition for System z image is deployed in read-only mode, the WebSphere Application Server home directory and SLES 11 Operating System cannot be modified, which includes installing fix packs and applying maintenance.

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)

Related tasks

- [Installing WebSphere Application Server Hypervisor Edition on System z](#)

Last updated: 2021-04-19

Hints and tips for WebSphere Application Server Hypervisor Edition for Novell SLES on System z

When installing, configuring, updating, or using the WebSphere® Application Server Hypervisor Edition, consider these points.

- The WebSphere Application Server administrative user ID, virtuser, and password are configured into the soap.client.props file and the ipc.client.props file (for version 7.x virtual images only) when the virtual image is configured. The passwords are encrypted with the ProfFilePasswordEncoder script. If you subsequently change the password for the virtuser user ID, these files also needed to be updated.

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)

Related tasks

- [Installing WebSphere Application Server Hypervisor Edition on System z](#)

Last updated: 2021-04-19

Differences between commands in virtual and native environments

When installing samples or managing profiles, the commands used in native WebSphere Application Server environments are sometimes different from the commands used in environments that contain IBM WebSphere Application Server Hypervisor Edition.

Although the IBM HTTP Server is installed as the user *virtuser*, there are some files that belong to the user *root*. The list of files that belong to *root*, can be seen using the following command: `find $IHS_INSTALL_ROOT -user root`. This difference dictates that some commands must be issued as *root* instead of *virtuser*.

```
virtuser@leolpar04:/opt/IBM/HTTPServer/bin> sudo -u root ./adminctl start
virtuser@leolpar04:/opt/IBM/HTTPServer/bin> sudo -u root ./adminctl stop
virtuser@leolpar04:/opt/IBM/HTTPServer/bin> sudo -u root ./apachectl start
virtuser@leolpar04:/opt/IBM/HTTPServer/bin> sudo -u root ./apachectl stop
```

There are some differences when using the `manageprofiles` command. The sample applications included with WebSphere Application Server are installed by default in the IBM WebSphere Application Server Hypervisor Edition version 8.5 virtual image. When using the native WebSphere Application Server GUI installer, the sample applications are not installed by default. If administrative security is enabled and you create additional profiles using the `manageprofiles.sh` script, include the following options to avoid validation errors:

The log locations are different for the profile creation and the augmentation operations. For the virtual images, the logs are located in the `profile_root/logs/manageprofiles` directory. This applies to all profiles.

In a native WebSphere Application Server environment, profiles are stored in the `opt/IBM/WebSphere/AppServer/Profiles` directory. IBM WebSphere Application Server Hypervisor Edition uses a different location. On the virtual images, profiles are stored in the `opt/IBM/WebSphere/Profiles` directory. Similarly, the `profileRegistry.xml` file is stored in the `<profile_root>/properties` directory for the virtual images, but is stored in the `<app_server_root>/properties` directory for native environments.

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)

Last updated: 2021-04-19

Troubleshooting and support

If you encounter problems, see the following information about how to troubleshoot a problem with your IBM® software.

About this task

Tools are included on your IBM WebSphere® Application Server Hypervisor Edition virtual images to assist with problem determination. The `was_mustgather.sh` script helps automate the data collection process for

you when troubleshooting a potential issue.

Procedure

1. Use the **was_mustgather.sh** script to gather information
IBM WebSphere Application Server Hypervisor Edition support teams can request the collection of additional documentation to assist with problem determination. The **was_mustgather.sh** script gathers this additional data. The script gathers information about the application server environment and the operating system and a compressed file is included in /tmp/was_mustgather.zip. To execute the script open a shell and run the **was_mustgather.sh** script using the following example:

```
# /opt/IBM/WebSphere/AppServer/virtual/service/was_mustgather.sh
```
2. If you configure APC elasticity while using Dynamic Clusters of ODR servers in an IWD or IPAS deployed cell, the following problems might occur:
 - If an ODR Virtual Machine is cloned, any advanced options associated with the ODR part will be executed again. For example, if you have configured an advanced option such as CPU Overload Protection value = 90% prior to Virtual System deployment, and then changed the value to 85% after deployment, it will be reset to 90% after the ODR VM is cloned.
If using a Dynamic Cluster of ODR servers with APC elasticity, make sure to plan ahead before creating your pattern. If you are unsure what values you will want in your advanced options on the ODR part, consider changing these settings after deployment.
 - When an emergency fix has been applied after deploying the virtual system, there can be a period of time where requests are not routed to the application server during ODR VM adds. If an emergency fix is required for a Virtual System with Dynamic Clusters of ODR servers and APC elasticity, you must clone and extend the image with the emergency fix and redeploy the Virtual System based on the new image.

Results

After successful completion of these steps, you will have gathered the diagnostic information needed to troubleshoot the issue you are experiencing.

Related concepts

- [WebSphere Application Server Hypervisor Edition overview](#)

Related information

- [About WebSphere Application Server Hypervisor Edition](#)

Last updated: 2021-04-19

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